

REMARKS

Claims 1-49, 52-65 and 67-72 are pending. This paper amends objected to dependent claim 8. This paper also amends claim 21 which was rejected under 35 USC §112. Also this paper amends previously rejected independent claims 49 and 63 to include the limitations of objected to claims 51 and 66 respectively, cancels claims 51 and 66, and amends claims 52, 55, 57, 59, 60, 61, 67 and 68 which depended from either canceled claim 51 or canceled claim 66. Claims 51 and 66 have now thus been canceled and it is respectfully asserted that independent claims 49 and 63 (and dependent claims 50, 52-62, 64-65, and 67-72) are now in condition for allowance. Finally, it is respectfully asserted as noted below that independent claims 1, 33 and 42 are patentably distinct from the cited art and thus favorable action on claims 1-48 is requested. Remarks are provided below with reference to like titled sections in the Detailed Action section of the Office Action.

Information Disclosure Statement

The Office Action indicated that certain references were not initialed on the Form PTO-1449 as each item was not identified properly (references C1-C9 not being initialed). A Third Supplemental Information Disclosure Statement is being submitted herewith in which additional identification information is provided on the PTO-1449 form for references C1-C9. Although these references were previously submitted in the pending case, the Applicant has provided copies of the references as originally submitted for the convenience of the Examiner. It is respectfully requested that the Form PTO-1449 is in condition for initialing and such initials are requested.

It is also noted that an additional Fourth Supplemental Information Disclosure Statement is also filed concurrently herewith. This IDS includes one reference (A35) that has been cited more than three months ago by the Applicant in related applications and four references (A31-A34) cited by Examiner Hannaher in related application 10/669,030 more than three months. As such a fee for the Fourth Supplemental Information Disclosure statement is concurrently filed.

Oath/Declaration

A replacement declaration is submitted herewith including a printed address rather than handsigned address. Applicant respectfully requests that this declaration be entered.

Drawings

A Request for Corrected Drawings and a Submission of Replacement Drawings is submitted herewith. Applicant respectfully requests that these drawings be entered.

Amendment to the Specification

Applicant has amended the Specification to correct typographical errors as identified in the Office Action. Applicant respectfully requests that these amendments be entered.

Claim Objections

Claim 8 has been amended to include a concluding period.

Claim Rejections 35 USC §112 – Claim 21

Claim 21 has been amended to address the §112 rejection.

Claim Rejections 35 USC §103 – Independent Claims 1, 33 and 42

Independent claims 1, 33 and 42 have been rejected under 35 USC §103 as being unpatentable over Rubloff in view of Nikoonahad. Reconsideration is respectfully requested.

Rubloff and Nikoonahad both disclose systems that operate in the VUV wavelengths. The Office Action notes that Rubloff discloses a reflectometer with a monochromator light source. The light beam of Rubloff is split by a beam splitter BS. One beam from the beam splitter forms a reference beam focus RBF in the plane of the oscillating tuning-fork chopper. [Rubloff, p. 1, Figure]. The light that is reflected from the sample creates a sample beam focus SBF in the plane of the chopper. The SBF is approximately 1-3mm laterally away from the focus

of the reference beam and approaches the chopper at a different angle. The chopper alternately blocks the sample and reference beams. [Rubloff, p. 2, Figure]

The Office Action notes that Nikoonahad discloses a system in which the dectector 58 (Figure 3) may be a spectrometer. [Office Action, p. 7; Nikoonahad, paragragh 0044, Figure 3] The Office Action notes that Nikoonahad “suggests the use of an arrary detector to accommodate changes in the incidence angle in the reflectometer (paragraph 0051).” [Office Action p. 8] The Office Action states that it would be obvious to replace the monochromator of Rubloff with a broadband light source and the replace the Rubloff photomultiplier with a spectrometer and arrary detector of Nikoonahad. [Office Action p. 8]

It is respectfully noted that in Nikoonahad the use of an array detector is described with reference to an alternative embodiment in which the angle of incidence of the illumination beam 40 may be changed. The array detector thus provides detectors in the array that are positioned to detect the collector radiation when the angle of the reflected radiation beam 52 changes due to the change in the angle of incidence of the illumination beam. The use of an array detector is described as an alternative to having to move the detector when changing the angle of incidence. [Nihoonahad, paragraph 0051]

Independent Claims 1 and 42

It is respectfully noted that even if combined, the combination suggested in the Office Action fails to teach certain limitations within independent claims 1 and 42 (and all claims depending therefrom). More particularly, it is noted that each claim includes limitations relating to generating multiple spatially separated wavelengths of light at an exit plane of the spectrometer and an array detector that receives the multiple spatially separated wavelengths of light. For example, independent claim 1 includes

...the spectrometer providing multiple spatially separated wavelengths of light at an exit plane of the spectrometer, the multiple spatially separated wavelengths of light including wavelengths of light below DUV wavelengths; and
an array detector that receives the multiple spatially separated wavelengths of light, the array detector detecting data for wavelengths below DUV wavelengths.

Similarly, claim 42 includes:

...providing multiple spatially separated wavelengths of light at an exit plane of the spectrometer, the multiple spatially separated wavelengths of light including wavelengths of light below DUV wavelengths; and
receiving the multiple spatially separated wavelengths of light with an array dectector, the array detector detecting data for wavelengths below DUV wavelengths in order to collect sample reflectance data for wavelengths below deep ultra-violet (DUV) wavelengths.

As noted above, Nikoonahad discloses the use of an array detector for a very different purpose. In particular, Nikoonahad discloses the use of an array detector to detect a wavelength of light when the incidence of the illumination beam 40 is changed and thus the angle of the reflected radiation beam also changes. The use of an array detector in such situation provides an alternative to moving the detector (because the beam has moved). Such a technique does not, however, disclose the use of multiple spatially separated wavelengths of light at an exit plane of the spectrometer or receiving the multiple spatially separated wavelengths of light with an array detector.

As such, it is respectfully asserted that even with the combination asserted in the Office Action, the combination lacks elements of independent claims 1 and 42. As such, favorable action is requested for independent claims 1 and 42 (and all claims depending therefrom).

Independent Claims 1, 33 and 42

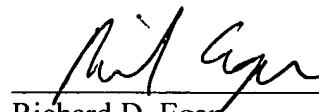
It is further respectfully asserted that the combination as asserted by the Office Action would be inoperable and is thus improper. Further, because one skilled in the art would recognize the inoperability of the combination, the references themselves teach away from the combination.

More particularly, the Office Action suggests that it would be obvious replace the monochromator of Rubloff with a broadband light source and the replace the Rubloff

photomultiplier with a spectrometer and array detector of Nikoonahad. [Office Action p. 8] However, it is respectfully noted that the insertion of a spectrometer in the system of Rubloff would result in a system that would not properly function. It is noted that in Rubloff two different light paths are created for the reference beam (RB) and the sample beam (SB) of the Rubloff figure. [Rubloff, p. 1-2, Figure] As further noted and shown, these two light signals approach the chopper and photomultiplier along two different light paths and correspondingly different angles. Spectrometers such as referenced in Nikoonahad utilize a single entrance slit as known to those in the art. The use of a single entrance slit, however, does not properly function when the two beam paths are varying such as in Rubloff. Using a spectrometer to analyze two different beam paths at two different entrance angles would result in wavelength and intensity errors that would provide an unacceptably inaccurate measurement. As such, the teachings of the two cited references would affirmatively discourage one skilled in the art from making the asserted combination. As such it is respectfully asserted that there is not a motivation to combine within the references themselves. For these reasons, and those cited above, it is asserted that independent claims 1, 33, and 42 (and all claims depending therefrom) are in condition for allowance.

In view of the foregoing it is believed all claims now pending are in condition for allowance. The examiner is invited to contact the undersigned at the phone number indicated below with any questions or comments, or to otherwise facilitate expeditious and compact prosecution of the application.

Respectfully submitted,



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